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No difference in postoperative outcome after acute surgery whether the patients presented for first time or are known with Crohn's disease

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ABSTRACT

Purposes: Acute operations (within 48 h) or urgent (within 2–7 days) carry the risk of unfavorable outcome as the patient is not optimized, the operation is performed by trainees and the disease is severe necessitating acute/urgent intervention. However, Crohn's disease (CD) patients who present as acute disease may have more favorable outcome because they did not receive medications, surgery is performed early and the disease is promptly controlled.

Aim: To investigate whether CD patients presented first time have more favorable outcome compared to those who are known with CD.

Method: Retrospective multi-center study. Rate of complications, duration of hospitalization and rate of re-admission were used as a measure of postoperative outcome. Univariate and multi-variate analyses were used.

Results: Sixty-one patients in whom acute CD was first presentation (group 1) did not have more favorable outcome compared to 167 patients known to have CD (group 2) and presented acute. Mean duration of hospitalization was 8.7 days in group 1 compared to 9.4 days in group 2. Complications occurred in 12/61 patients (19.7%) in group 1 compared to 39/167 patients (23.4%) in group 2: odds ratio 1.113, CI [0.611–2.024]. No difference in intra-abdominal septic complications rate was found between the two groups: odds ratio 0.932, CI [0.369–2.355]. Re-admission was seen in six patients (9.8%) in group 1 vs. 23 (13.8%) in Group 2: odds ratio 1.464, CI [0.566–3.788].

Conclusion: Patients undergoing acute surgery for the first CD presentation did not have more favorable outcome compared to those undergoing acute intestinal resection for known CD.

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1. What this paper adds to the literature

This paper investigate a question frequently asked about the postoperative complications in patients with Crohn's disease. Although, it shows no difference in postoperative outcome, it adds to our understanding of factors influencing the postoperative complications.

2. Background

Surgical intervention plays an important role in the treatment of

Crohn's disease (CD) when medical treatment fails to provide adequate symptomatic relief or complications related to the disease arise. The probability of surgery is 30% during the first year of the disease and ranges between 30% and 70% 10 years after diagnosis [1,2]. The cumulative risk for surgery is approximately 38%, 48% and 58% at 5, 10 and 20 years after diagnosis, respectively [3,4]. There is however a tendency to decreased surgery rates recently most probably due to improvement in medical treatment [2,3]. Timing of surgical intervention in treatment of CD remains a crucial yet controversial issue. Acute operations (within 48 h) or urgent (within 2–7 days) carry the risk of unfavorable outcome as the patient is not optimized, the operation is most likely performed by trainees and the disease is so severe necessitating acute/urgent intervention. However, CD patients who presented as acute disease

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may have more favorable outcome because they did not receive medications, surgery is performed early and the disease is promptly controlled.

3. Objective

To investigate whether CD patients presented first time as acute severe disease treated surgically have more favorable outcome compared to those undergoing acute or urgent surgery for known CD.

4. Method

4.1. Study design

This is multicenter retrospective cohort study.

CD patients operated in Hvidovre, Hillerød, Køge, Slagelse, Aalborg and Munich hospitals in the period between 2003 and 2013 were identified from hospital records using diagnosis code for CD and operation codes for different CD abdominal operations. Part of the data was collected during another study [5]. Data protection agency permission was obtained prior to start data collection. Demographic data, pre-operative medications, previous operations for CD, pre-operative sepsis, operation details and 30-days post-operative follow up were registered according to pre-defined study protocol.

4.2. Null hypothesis

No difference in postoperative outcome after acute surgery in CD patients presented first time and those who are known with CD.

4.3. Outcome variables

Primary outcome variable is 30-days postoperative complication rate. The definition of “intraabdominal septic complications” (IASC) was: anastomotic leak, intestinal fistula, intraabdominal abscess and/or peritonitis.

Secondary outcome variables are length of postoperative stay and re-admission rates.

Inclusion and exclusion criteria.

Only CD resections were included as shown in the study flowchart (Fig. 1). Elective operations were excluded to ensure two comparable groups:

- Group 1: patients in whom surgery was performed at the time of diagnosis. These patients underwent surgery for acute or sub-acute presentation of CD. In this group, the diagnosis of CD was usually established at laparotomy and/or by the histopathological examination of the resected specimen. None of these patients had received specific medical treatment prior to surgery.
- Group 2: patients with established diagnosis of CD who underwent acute or urgent surgery during the course of the disease because of intestinal complications or refractoriness to medical therapy.

4.4. Ethical considerations

Data protection agency's approval was obtained prior to collect data.

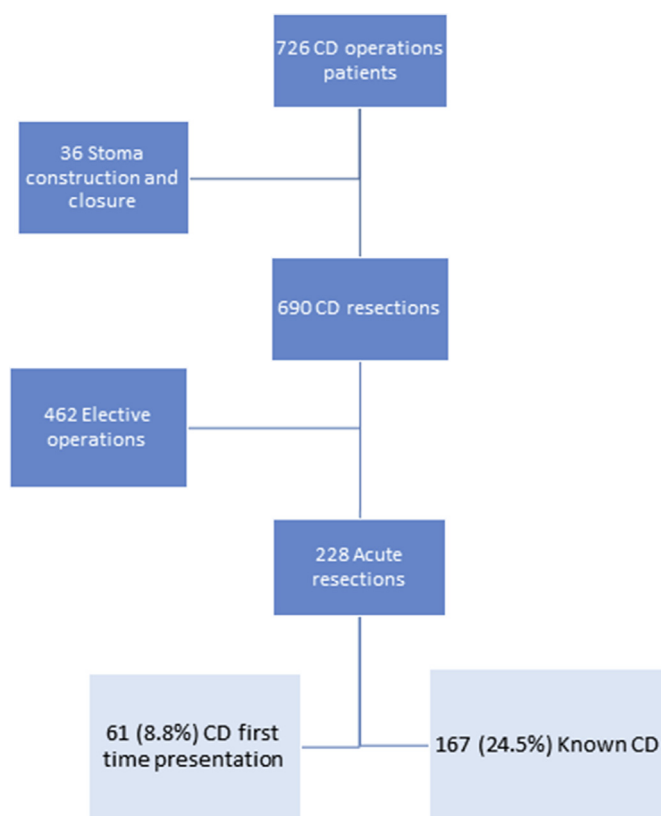


Fig. 1. The study flowchart.

4.5. Statistical analysis

Continuous data was log transformed to insure normal distribution of data before conducting ANOVA. One way ANOVA was used in univariate analysis for continuous data. Cross tabulation with Pearson's Chi square and Fisher's exact tests were applied when appropriate. All variables in univariate analysis were included in multi-variate analysis using linear regression and multiple regression. Results were reported using 95% confidence interval [CI] and odds ratio. P-value less than 0.05 was considered significant. SPSS version 19 used for all analyses.

5. Results

Six hundred ninety CD resections with primary anastomosis were identified using hospital data register (Fig. 1). Mean age was 40 years (range 12–90 standard deviation 16.01). Patients operated electively (N = 462, 67%) had shorter duration of hospitalization: mean 7.7 days compared to 9.2 days (p = 0.001) in patients undergoing urgent or acute surgery (N = 228). However, no difference in complication rate (Odds ratio 0.919, CI [0.755–1.118], p = 0.401) and no difference in re-admission rates (Odds ratio 0.993, CI [0.649–1.52], p = 0.97) were noted between the two groups. Sixty-one patients (Group 1, 8.8%) in whom acute CD was first presentation did not have more favorable outcome compared to 167 (24.5%) patients known to have CD and presented acute (Group 2). Patients' characteristics of the two groups are shown in Table 1. Mean duration of hospitalization was 8.7 days in group 1, compared to 9.4 days in group 2 (CI [8.3–10.2] and p = 0.57). Complications occurred in 12/61 patients (19.7%) in group 1, compared to 39/167 patients (23.4%) in group 2: odds ratio 1.113, CI [0.611–2.024]. No difference in intra-abdominal septic complication was found

Table 1
Characteristics of the two groups.

	First time CD (N = 61)	Known CD (N = 167)	P value
Age (mean)	45.7	39	0.005
Gender (Female %)	53.7%	45.2%	0.954
Pre-operative sepsis (<i>intra-abdominal abscess or enteric fistula</i>)	12 (19.8%)	26 (15.6%)	0.291
Previous intestinal resection	0	71 (42.5%)	–
Pre-operative medical treatment			
Steroids	0	86 (51.5%)	–
Immunomodulators	0	68 (40.7%)	–
Biologics	0	23 (13.8%)	–
Postoperative outcome			
IASC ^a	7 (11.5%)	18 (10.8%)	0.881
Overall postoperative complications	12 (19.7%)	39 (23.4%)	0.727
Re-admission	6 (9.8%)	23 (13.8%)	0.43
Length of hospital stay	8.7	9.4	0.526
Type of resections			
Small bowel resection	10 (16.4%)	29 (17.4%)	–
Ileo-colic resection	34 (55.7%)	97 (58.1%)	–
Colectomy	12 (19.8%)	29 (17.4%)	–
Others	5 (8.2%)	12 (7.2%)	–

CD: Crohn's disease.

^a IASC: intra-abdominal septic complications: anastomotic leak, intra-abdominal abscess and enteric fistula.

between the two groups: odds ratio 0.932, CI [0.369–2.355]. Re-admission was seen in six patients (9.8%) in group 1 vs. 23 (13.8%) in Group 2 (Odds ratio 1.464, CI [0.566–3.788], RR 1.04 CI [0.942–1.156]).

No difference was shown between the two groups regarding complications, re-admission and duration of hospitalization in multivariate analysis using binary and logistic regression after adjusting for age, gender, pre-operative treatment (steroids, immuno-modulators and biologics respectively) and pre-operative sepsis defined as pre-operative intra-abdominal abscess or pre-operative enteric fistula.

6. Discussion

This study shows no difference in postoperative outcome between CD patients who had acute surgical intervention whether they were presented first time or were known as CD patients. This point is important to clarify as many factors were attributed to postoperative outcome. Some of these factors were investigated like pre-operative sepsis [6,7], disease localization [5], smoking [8], nutritional status [6,9] and medications. Pre-operative medical treatment was shown to be an important factor in postoperative complications. This is most apparent in case of steroids [6,9–12], and, in lesser extent, immune-modulators [13] and biological treatment [14]. All these drugs have been implicated as causal agents for perioperative wound healing and infectious complications in Rheumatoid arthritis patients [15]. Extra-intestinal manifestations, long duration of symptoms leading to surgery, weight loss [16,17], disease phenotype, duration of surgery and hand sewn anastomosis [9,18,19] in addition to length of the affected segment [7,16] were also investigated showing some of them to be associated with postoperative complications. Other factors were not sufficiently investigated yet to our knowledge like disease severity and pre-operative optimization.

The results of our study support the results of other studies [5,19] that operation's urgency does not affect the postoperative outcome. Aratari et al. has also showed no difference between CD patients presented for the first time in acute setting and those who are known with CD [19] regarding postoperative morbidity. Heilmann et al. investigated the characteristics of primary and repeated CD operations and found that CD patients with repeated operation have more need for blood transfusion and permanent stoma [20].

However, acute colo-rectal surgeries are associated with an increased postoperative morbidity and mortality in patients with Ulcerative colitis [21,22]. This might be related to the fact that many acute interventions are performed by trainees as in colorectal cancer [23] or in centers with low volume [22].

Our study has the inherited limitations of retrospective studies. It is not clear whether the patients were optimized pre-operatively or not. Disease severity is very difficult to trace in retrospective studies as the CD indices have limited used in daily practice. Missing data about diseases phenotype and diseases localization added to the limitations of the study.

A common problem in most of the surgical CD studies is lack of prospective randomized studies. This has affected the quality of surgical meta-analyses on inflammatory bowel diseases compared with medical meta-analyses [24]. One of the causes is the heterogeneity of CD, small number series and multi-factorial causes effecting the postoperative outcome. Thus, including a statistically representative sample in randomized CD studies may take many years. The only way out of this lack of knowledge is to generate knowledge through multi-center prospective randomized studies. A promising start is the European Colo-proctology society's first prospective audit on right hemi-colectomy and ileo-cæcal resections which will fortunately include CD patients.

7. Conclusion

Patients who undergo elective surgery tend to have shorter duration of hospitalization but no difference in the rate of complications or re-admission. Patients, whom first CD presentation was acute, did not have more favorable outcome compared to those undergoing acute or urgent surgery for known CD.

Ethical approval

Data protection agency's approval was obtained prior to collect data from Danish agency for data protection.

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None.

Author contribution

AE contributed to the conception of the study and statistical analyses. All authors contributed to data collection and manuscript preparation.

Conflicts of interest

None.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.ijso.2016.11.001>.

References

- [1] Vester-Andersen MK, Prosberg MV, Jess T, Andersson M, Bengtsson BG, Blixt T, et al. Disease course and surgery rates in inflammatory bowel disease: a population-based, 7-year follow-up study in the era of immunomodulating therapy. *Am J Gastroenterol* 2014;109:705–14.
- [2] Vind I, Riis L, Jess T, Knudsen E, Pedersen N, Elkjær M, et al. Increasing incidences of inflammatory bowel disease and decreasing surgery rates in Copenhagen city and county, 2003 – 2005: a population-based study from the Danish Crohn colitis database. *Am J Gastroenterol* 2006;101:1274–82.
- [3] Rungoe C, Langholz E, Andersson M, Basit S, Nielsen NM, Wohlfahrt J, et al. Changes in medical treatment and surgery rates in inflammatory bowel disease: a nationwide cohort study 1979–2011. *Gut* 2014;63:1607–16.
- [4] Peyrin-Biroulet L, Harmsen WS, Tremaine WJ, Zinsmeister AR, Sandborn WJ, Loftus Jr EV. Surgery in a population-based cohort of Crohn's disease from Olmsted County, Minnesota (1970–2004). *Am J Gastroenterol* 2012;107:1693–701.
- [5] El-Hussuna A, Andersen J, Bisgaard T, Jess P, Henriksen M, Oehlenschläger J, et al. Biologic treatment or immunomodulation is not associated with post-operative anastomotic complications in abdominal surgery for Crohn's disease. *Scand J Gastroenterol* 2012;47:662–8.
- [6] Alves A, Panis Y, Bouhnik Y, Pocard M, Vicaut E, Valleur P. Risk factors for intra-abdominal septic complications after a first ileocecal resection for Crohn's disease: a multivariate analysis in 161 consecutive patients. *Dis Colon Rectum* 2007;50:331–6.
- [7] Yamamoto T, Keighley MRB, Kingdom U. Factors affecting the incidence of postoperative septic complications and recurrence after stricturoplasty for Jejunoileal Crohn's Disease. *Am J Surg* 1999;178:240–5.
- [8] Reese GE, Nanidis T, Borysiewicz C, Yamamoto T, Orchard T, Tekkis PP. The effect of smoking after surgery for Crohn's disease: a meta-analysis of observational studies. *Int J Colorectal Dis* 2008;23:1213–21.
- [9] Yamamoto T, Allan RN, Keighley MRB. Risk factors for intra-abdominal sepsis after surgery in Crohn's disease. *Dis Colon Rectum* 1999;42:1141–5.
- [10] Subramanian V, Saxena S, Kang J-Y, Pollok RCG. Preoperative steroid use and risk of postoperative complications in patients with inflammatory bowel disease undergoing abdominal surgery. *Am J Gastroenterol* 2008;103:2373–81.
- [11] Heuschen UA, Hinz U, Allemeyer EH, Autschbach F, Stern J, Lucas M, et al. Risk factors for ileoanal J pouch-related septic complications in ulcerative colitis and familial adenomatous polyposis. *Ann Surg* 2002;235:207–16.
- [12] Post S, Betzler M, Dittfurth BVON, Schürmann G, Küppers P, Herfarth C. Risks of intestinal anastomoses in Crohn's disease. *Ann Surg* 1991;213:37–42.
- [13] Myrelid P, Olaison G, Sjö Dahl R, Nyström P-O, Almer S, Andersson P. Thiopurine therapy is associated with postoperative intra-abdominal septic complications in abdominal surgery for Crohn's disease. *Dis Colon Rectum* 2009;52:1387–94.
- [14] El-Hussuna A, Krag A, Olaison G, Bendtsen F, Gluud LL. The effect of anti-tumor necrosis factor alpha agents on postoperative anastomotic complications in Crohn's disease: a systematic review. *Dis Colon Rectum* 2013;56:1423–33.
- [15] Bibbo C. Wound healing complications and infection following surgery for rheumatoid arthritis. *Foot Ankle Clin* 2007;12:509–24. vii.
- [16] Ilesalniks I, Kilger A, Glass H, Müller-Wille R, Klebl F, Ott C, et al. Intra-abdominal septic complications following bowel resection for Crohn's disease: detrimental influence on long-term outcome. *Int J Colorectal Dis* 2008;23:1167–74.
- [17] Ilesalniks I, Kilger A, Glass H, Obermeier F, Agha A, Schlitt HJ. Perforating Crohn's ileitis: delay of surgery is associated with inferior postoperative outcome. *Inflamm Bowel Dis* 2010;16:2125–30.
- [18] Kanazawa A, Yamana T, Okamoto K, Sahara R. Risk factors for postoperative intra-abdominal septic complications after bowel resection in patients with Crohn's disease. *Dis Colon Rectum* 2012;55:957–62.
- [19] Aratari A, Papi C, Leandro G, Viscido A, Capurso L, Caprilli R. Early versus late surgery for ileo-caecal Crohn's disease. *Aliment Pharmacol Ther* 2007;15(26):1303–12.
- [20] Heimann TM, Greenstein AJ, Lewis B, Kaufman D, Heimann DM, Aufses AH. Comparison of primary and reoperative surgery in patients with Crohn's disease. *Ann Surg* 1998;227:492–5.
- [21] Ananthakrishnan AN, McGinley EL. Weekend hospitalisations and post-operative complications following urgent surgery for ulcerative colitis and Crohn's disease. *Aliment Pharmacol Ther* 2013;37:895–904.
- [22] Tøttrup A, Erichsen R, Sværke C, Laurberg S, Sørensen HT. Thirty-day mortality after elective and emergency total colectomy in Danish patients with inflammatory bowel disease: a population-based nationwide cohort study. *BMJ Open* 2012;2:e000823.
- [23] Archampong D, Borowski D, Lh I. Workload and surgeon's specialty for outcome after colorectal cancer surgery *Cochrane Database. Syst Rev* 2012;14(3):CD005391.
- [24] Laws P, Engel A. Inflammatory bowel disease meta-evidence and its challenges: is it time to restructure surgical research? *Color Dis* 2015;17:600–11.